

## **REMARKS**

### **I. REQUEST TO WITHDRAW FINALITY OF OFFICE ACTION**

The Examiner has made the outstanding Office Action final based on the allegation that Applicants' amendment filed on December 2, 2003 necessitated the new ground of rejection. However, claim 16 was not amended and claim 1 was amended by incorporating the substantive feature of previously examined claim 2 so that the new rejections thereto were not necessitated by amendment. Moreover, the amendment was filed with an RCE which defined new features of the invention (e.g., new claims 17-22), so that a first action final is NOT appropriate. Accordingly, it is respectfully requested that the finality of the outstanding Office Action be withdrawn.

### **II. REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH**

Claim 16 stands rejected under 35 U.S.C. § 112, second paragraph. This rejection is respectfully traversed for the following reasons. The Examiner alleges that it is not clear whether claim 16 is dependent on claim 1 or not. It is respectfully submitted that claim 16 is merely written in the ordinary manner by which the *combination* (i.e., "optical disk apparatus") defines as an element thereof the *subcombination* ("semiconductor laser device"). Accordingly, in response to the Examiner's inquiry, it is respectfully submitted that claim 16 is a dependent claim which defines an optical disk apparatus that includes as an element thereof a semiconductor laser device as recited in claim 1 (i.e., an optical disk apparatus including a semiconductor laser device, where the semiconductor laser device comprises all of the features recited in claim 1). Based on all the foregoing, it is submitted that claim 16 is definite. Accordingly, it is respectfully requested that the rejection of claim 16 under 35 U.S.C. § 112, second paragraph be withdrawn.

### III. REJECTION UNDER 35 U.S.C. § 103

Claims 1, 3-5, 7-9 and 11-22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Sagawa et al. '931 ("Sagawa") in view of Dickey et al. '874 ("Dickey"), and claim 16 stands rejected under 35 U.S.C. § 103 as being unpatentable over Sagawa in view of Dickey and Yamanaka. Claims 1 and 12 are independent. These rejections are respectfully traversed for the at least the following two reasons.

#### A. **Niobium oxide of Dickey related to anti-reflection films for large area use, not for small area semiconductors**

The Examiner admits that Sagawa does not disclose using a layer including niobium oxide as part of the reflective film of the laser device and therefore relies on Dickey's teaching of a niobium oxide layer to modify Sagawa so as to reach the claimed invention. However, Dickey merely discloses niobium oxide generally for "large area commercial coating applications" (*see* col. 1, lines 15-16) and is not related to the substantially smaller semiconductor laser device field. Dickey suggests niobium oxide as a means to improve **large** area production rates for applications such as a "picture frame glass and a display case, and as thermal control coatings for architectural and automobile glazings" (*see* col. 1, lines 38-40).

Indeed, Dickey's purpose is to provide a higher production rate for anti-reflection films for such large area applications (e.g., "[i]n the architectural glass coating industry", *see* col. 3, line 6), as set forth at col. 4, lines 16-49 in describing the objects of the invention (i.e., providing "a simple antireflection layer system which may be deposited at low cost in a **large** area, in-line sputtering machine and to provide a simple enhanced reflector coating which may be deposited at low cost in a **large** area in-line sputtering machine, whereby coatings including niobium oxide layers may be less expensive to produce since they may be deposited at high production rates.

The lower cost may extend the application of such coatings to new and useful areas such as antireflection coatings on *architectural and automobile glazings*” (emphasis added)).

Dickey provides no motivation or suggestion for using niobium oxide anti-reflection film in the substantially smaller field of semiconductor lasers. Indeed, there is no objective evidence that the higher production rates relative to the titanium based reflective films are achievable in the semiconductor laser application. Nonetheless, the purpose and asserted benefits of using niobium oxide taught by Dickey are unrelated to the laser device of Sagawa so as to leave the proposed combination without the requisite motivation. Only Applicants’ specification provides motivation for using niobium oxide specifically with internal cavity lasers in the manner set forth in the pending claims. For example, the present invention enables suppression of the temperature increase in the vicinity of the end facet of the resonant cavity so that output power can be increased, while the prior art is silent as to such problems let alone possible solutions.

Further, only Applicants’ specification provides the motivation for the *combination* of an internal laser (end facets) and niobium oxide, whereas Sagawa does not disclose niobium oxide and Dickey merely suggests niobium oxide anti-reflection films for increasing production rates in *large*-area applications. The prior art is silent as to the heating problem of internal lasers and the ability of niobium oxide to solve such problems by forming a niobium oxide film on an end facet of the laser.

**B. No motivation to modify operating wavelength of the laser device of Sagawa**

The Examiner admits that Sagawa does not disclose using a layer including niobium oxide as part of the reflective film and therefore relies on Dickey’s teaching of a niobium oxide layer to modify Sagawa so as to reach the claimed invention. Even assuming *arguendo* that the

modification with respect to niobium oxide is proper, it is respectfully submitted that the Examiner's proposed combination still lacks the requisite rationale for modifying Sagawa's laser device to operate within a wavelength of 0.4  $\mu\text{m}$  or less. Sagawa expressly discloses using an infrared laser device having an oscillation wavelength within a range of 0.9  $\mu\text{m}$  to 1.1  $\mu\text{m}$  (see col. 2, lines 3-5) and the relied on portions of the cited prior art do not suggest the *desirability* of operating within the claimed wavelength range.

The Examiner relies on Dickey's *incidental* disclosure that niobium oxide *can* work with a light having the specifically listed wavelengths of 0.4 or 0.38 $\mu\text{m}$ . However, Dickey is merely listing those wavelengths as part of a table for comparing the optical constants of niobium oxide (i.e., refractive index "n" and extinction coefficient "k") with titanium oxide over a wide range of wavelengths. The Examiner's relied on portions of Dickey do NOT suggest the desirability of operating with a wavelength of 0.4  $\mu\text{m}$  or less over any other wavelength.

The Examiner is directed to MPEP § 2143.01 under the subsection entitled "Fact that References Can Be Combined or Modified is Not Sufficient to Establish *Prima Facie* Obviousness", which sets forth the applicable standard:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. (*In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990)).

In the instant case, even assuming *arguendo* that Sagawa can be modified by Dickey, it is submitted that the "mere fact that [Sagawa and Dickey] can be combined ... does not render the resultant combination obvious" because nowhere does the *prior art* "suggest the desirability of the combination" as set forth by the Examiner. The Examiner has not provided any *objective* evidence that the *cited prior art* suggests the desirability of modifying the expressly disclosed *infrared* laser device having an oscillation wavelength within a range of 0.9  $\mu\text{m}$  to 1.1  $\mu\text{m}$  of Sagawa to operate

at a wavelength of 0.4  $\mu\text{m}$  or less. Indeed, such a modification is NOT enabled by the prior art (i.e., no evidence that Sagawa's infrared laser can be modified to output a wavelength of 0.4  $\mu\text{m}$  or less) and would nonetheless render Sagawa inoperable for its intended purpose.

It is again emphasized that one of the objects of the present invention is to enable suppression of the degradation of characteristics of a semiconductor laser device having an oscillation wavelength of 0.4  $\mu\text{m}$  or less, which is shorter than that of conventional semiconductor laser devices, due to heat generation of the end facet reflective film. According to an aspect of the present invention, because an absorption coefficient of niobium oxide is smaller than that of titanium oxide when the oscillation wavelength is 0.4  $\mu\text{m}$  or less, there is an advantage, which is new and unexpected, over the prior art of using niobium oxide for the end facet reflective film specifically in *combination* with an oscillation wavelength of 0.4  $\mu\text{m}$  or less. Only Applicants have considered such problems with the conventional laser and provide the means to solve said problems in relation to the aforementioned combination.

### C. Summary

In sum, the present invention focuses generally on solving a problem of the end-facet reflective laser device, which is more sensitive to heat generation in the reflective film; and particularly on an advantage of niobium oxide over titanium oxide in a region where an oscillation wavelength is 0.4  $\mu\text{m}$  or less. On the other hand, Sagawa is silent as to niobium oxide and Dickey teaches niobium oxide for production efficiency purposes for large-area structure rather than for small-area semiconductors so as to be unrelated to the Sagawa device. Dickey provides no motivation for using niobium oxide in the *laser* device of Sagawa nor to modify/enable the laser device to operate within the claimed range.

Accordingly, in view of the foregoing, it is respectfully submitted that there is no proper motivation for combining Sagawa and Dickey in the manner set forth by the Examiner so as to leave the proposed combination as being based solely on improper hindsight reasoning using only Applicants' specification as a guide to reconstruct the claimed invention.

Based on all the foregoing, it is submitted that all pending claims are patentable over the cited prior art. Accordingly, it is respectfully requested that the rejections under 35 U.S.C. § 103 be withdrawn.

### CONCLUSION

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below. To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY



Ramyar M. Farid

Registration No. 46,692

600 13<sup>th</sup> Street, N.W.  
Washington, DC 20005-3096  
(202) 756-8000 RMF:mcm  
Facsimile: (202) 756-8087  
**Date: May 5, 2004**